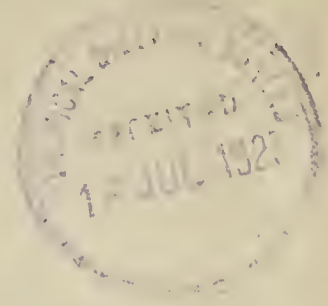
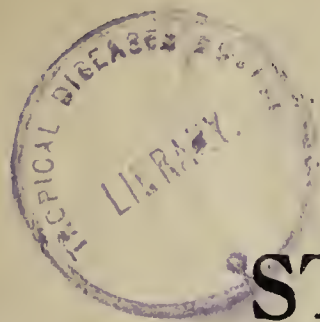


*a Cd. Elman*  
*sp 1*  
**The Municipality of George Town,  
Penang,**



**STRAITS SETTLEMENTS**

---

**HEALTH OFFICER'S**

**ANNUAL REPORT**

**FOR THE YEAR**

**1922.**

---

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## STATISTICAL SUMMARY.

Situation	...	...	...	Lat. 5° 24' N. Long 100° 1' E.
Average Elevation			...	Town area 12 ft, 6 ins.
above L. W. M. O S. T.		}	...	Country area 25 ft, 0 in.
O. S. Tides rise and fall			...	9 ft, 0 in.
Rainfall 1922 (average of three readings within Municipal Limits)...				118.24 inches
Mean Temperature 1922	...	...		80.74° F.
Maximum do	...	...		94° F.
Minimum do	...	...		67° F.
Total area of Penang Island			...	108 sq. miles.
Area within Municipal Limits			...	9. 4 sq. miles or 5803 acres
Estimated population (mid-year)			...	125,834
Density of population	...	...		{ 13,386 per sq. mile. 21.7 per acre.
Crude Death Rate	...	...		29.94 per mille.
Infant Mortality	...	...		166 per thousand.
Birth Rate	...	...		29.71 per mille.
Sterling equivalent of \$1	...	...		2s. 4d. (approximately)

*Tubercle prev. 486. <sup>not</sup> 637 death*  
*mostly among Chinese males*

# STAFF OF THE HEALTH DEPARTMENT

On 31st December 1922.

J. Stuart Rose	...	M. B., D. P. H.			
		Health Officer,			
		Registrar of Births and Deaths,			
		Deputy Superintendent of Vaccination,			
		Medical Superintendent of Infectious Diseases Hospital.			
G. S. Glass	...	B. A., M. B., D. P. H., D. T. M. and H.			
		Deputy Health Officer,			
		Deputy Registrar of Births and Deaths,			
		Deputy Superintendent of Vaccination,			
Khoo Tiang Phean	...	M. B., B. S. (Hong Kong)			
		Deputy Registrar of Deaths.			
W. A. Ward	...	Chief Sanitary Inspector, joined the service	1st January	1893.	
A. A. Jeremiah	...	Sanitary Inspector, joined the service	„ „	1904.	
J. S. Reutens	...	do	do	„ „	1905.
H. L. McCulloch	...	do	do	„ „	1912.
R. J. Rangel	...	Sanitary Sub-Inspector	do	„ October	1913.
B. B. Peters	...	do	do	„ May	1918.
G. Martinez	...	do	do	„ Nov :	1918.
M. D'Souza	...	do	do	„ April	1919,
G. F. Scully	...	do	do	11th July	1919.
A. Mathuray	...	do	do	10th October	1919.
J. Loh	...	do	do	17th May	1921.
Ow Leong Chye	...	do	do	1st July	1921.
E. V. Lessler	...	do	do	„ „	„
P. Freedy	...	do	do	„ „	„
V. E. Rozells	...	do	do	„ Sept :	„
Lim Thean Soo	...	do	do	„ „	„
F. A. Scully	...	do	do	„ May	1922.
Lim Choon Hock	...	do	do	„ August	„
Yeap Hin Tat	...	do	do	14th „	„
Miss A. Laurie	...	District Nurse	do	1st July	1921.
Vacant		do			

Seven Certified Chinese Midwives as part time District Nurses.



MUNICIPAL HEALTH OFFICE, PENANG.

19th February, 1923.

To  
The Municipal Commissioners,  
Gentlemen,

I have the honour to submit the following report on the health of the Municipality during 1922.

Population.

1. The estimated population was 125,834 divided among the various nationalities as follows:—

Table I.

Nationality.				Males.	Females.	Total.
European	...	...	..	659	396	1,055
Eurasian	...	...	...	706	844	1,550
Chinese	...	...	...	51,570	32,856	84,426
Malay	...	...	...	8,680	8,760	17,440
Indian	...	...	...	15,410	4,575	19,985
Others	...	...	..	755	623	1,378
Total				77,780	48,054	125,834

Births.

2. There were 3738 births registered of whom 1971 were males and 1767 females, the birth rate being 29.71 per thousand. The figures for 1921 were, births 3768 and birth rate 30.56.

Reckoned on the estimated female population alone the birth rate was 77.71 per thousand compared to 80.05 per thousand in 1921.

For some reason which is not obvious the number of births registered during the last two months of the year was considerably less than the average for the previous ten months.

The number of births and the birth rates for the various nationalities were as follows :—

Table II.

Nationality.				Number of Births.			Birth rate per thousand.	
				Males.	Females.	Total.	Total population.	Female population.
European	...	...	...	28	26	54	51.18	136.36
Eurasian	...	...	...	31	22	53	34.19	62.80
Chinese	...	...	...	1,395	1,260	2,655	31.44	80.80
Malay	...	...	...	281	253	534	30.61	60.95
Indian	...	...	...	210	194	404	20.21	88.30
Other nations	...	...	...	26	12	38	27.57	60.99

During the previous ten years the births registered were : —

**Table III.**

Year.			European	Eurasian.	Chinese.	Malay.	Indian.	Others.	Total.
1912	...	...	37	44	1,408	440	415	77	2,421
1913	...	...	29	40	1,492	398	413	82	2,464
1914	...	...	27	57	1,575	368	445	72	2,545
1915	...	...	46	38	1,774	478	403	78	2,808
1916	...	...	34	47	1,785	362	393	90	2,708
1917	...	...	39	44	2,010	463	472	71	3,099
1918	...	...	57	53	2,008	403	381	38	2,940
1919	...	...	41	51	2,134	481	467	29	3,203
1920	...	...	46	43	2,250	468	464	50	3,321
1921	...	...	48	71	2,623	557	437	32	3,768
Average for ten years			40	49	1,905	442	430	62	2,928
1922	...	...	54	53	2,655	534	404	38	3,738

The Chinese births are the highest yet recorded.

A comparison of the births and deaths in the different nationalities may be of interest :—

**Table IV.**

Nationality.					Births.	Birth rate per thousand.	Deaths.	Death rate per thousand.
European	...	...	...	...	54	51.18	12	11.37
Eurasian	...	...	...	...	53	34.20	34	21.93
Chinese	...	...	...	...	2,655	31.44	2,130	25.23
Malay	...	...	...	...	534	30.61	464	26.60
Indian	...	...	...	...	404	20.21	544	27.22
Others	...	...	...	...	38	27.57	46	33.38

### Deaths.

3. The gross total of deaths within Municipal Limits during the year was 3768 and the crude death rate 29.94; of this number 538 were not normally resident in Penang and had been less than three months within municipal limits. Omitting these, we have 3230 deaths and a corrected death rate of 25.67 per thousand.

The rate is more than 8 per cent lower than the average for the preceding ten years, and 1 per thousand lower than that of the year 1921.

The following table shows the distribution of the deaths in age groups and nationalities.—

Table V.

Nationality.	Sex.	Age.											Total.	Grand Total.
		Under 1 year.	1 to 5 years.	5 to 15 years.	15 to 25 years.	25 to 35 years.	35 to 45 years.	45 to 55 years.	55 to 65 years.	65 to 75 years.	over 75 years.	Unknown.		
European ...	{ M.	1	...	...	1	1	...	1	...	1	...	...	5	12
	{ F.	1	2	...	...	...	...	3	...	1	...	...	7	
Eurasian ...	{ M.	4	1	...	1	4	4	...	1	3	...	...	18	34
	{ F.	3	2	1	1	3	3	1	1	1	...	...	16	
Chinese ...	{ M.	248	105	53	89	185	227	215	167	64	17	42	1412	2130
	{ F.	169	113	43	59	74	68	66	50	51	20	5	718	
Malay ...	{ M.	63	34	16	14	16	21	18	15	12	11	3	223	464
	{ F.	38	28	17	21	29	24	17	20	18	38	...	241	
Indian ...	{ M.	48	23	11	42	71	76	33	30	16	6	10	366	544
	{ F.	44	20	13	20	23	15	7	7	13	14	2	178	
Other Nationalities ...	{ M.	1	2	1	1	...	1	5	2	3	2	...	18	45
	{ F.	1	8	2	3	2	3	2	...	1	5	...	27	
Unknown ...	{ M.	...	...	...	...	...	...	...	...	...	...	...	...	1
	{ F.	1	...	...	...	...	...	...	...	...	...	...	1	
Total ...	{ M.	365	165	81	148	277	329	272	215	99	36	55	2042	3230
	{ F.	257	173	76	104	122	113	96	78	85	77	7	1188	
Grand Total		622	338	157	252	399	442	368	293	184	113	62	3230	

Compared with 1921 the Chinese and Indian deaths are less by 92 and 82 respectively, while the Malay deaths have increased by 76.



The total deaths of each nationality in the last ten years is shown here.

Table VI.

Year.				European.	Eurasian.	Chinese.	Malay.	Indian.	Others
1913	...	...	...	9	30	2,276	460	759	55
1914	...	...	...	10	35	2,260	506	715	48
1915	...	...	...	8	36	2,087	473	565	37
1916	...	...	...	11	35	2,119	436	527	33
1917	...	...	...	11	36	2,484	549	688	59
1918	...	...	...	9	26	2,930	479	927	56
1919	...	...	...	13	34	2,539	528	872	38
1920	...	...	...	11	44	2,398	382	676	42
1921	...	...	...	10	26	2,213	394	629	41
1922	...	...	...	12	34	2,130	464	544	46

Infant Mortality.

4. The infant mortality was 166 per thousand births: this is the lowest rate recorded for the Municipality: in 1920 and 1921 the rates were 205, and 167: the average for the preceding ten years is 237.

It is pleasing to be able to report a slight decline in our infant mortality: but the rate is still much too high even for an eastern town.

Our district nurse and the part-time locally qualified midwives did their utmost and we may assume that much of the reduction in our infant mortality rate is due to the services of these women.

Maternal ignorance of cleanliness and the up-bringing of a child in its early days of life is still deplorable.

It will take many years of hard work and persistent persuasion to rid the town of dangerous customs and superstitions.

Of the 622 infants who died in 1922, there were 217 under one month of age, 165 between one and three months and 240 between three and twelve months.

Appended is Table VII showing the infant mortality in the various nationalities and a comparison with 1921.

Table VII.

Nationality.				Births.	Deaths under one year.	Infant deaths per thousand births.	
				1922.		1922.	1921.
European	...	...	...	54	2	37	62
Eurasian	...	...	...	53	7	132	84
Chinese	...	...	...	2,655	417	157	168
Malay	...	...	...	534	101	189	131
Indian	...	...	...	404	92	228	229
Others	...	...	...	38	3	79	218
Total				3,738	622	166	167



The chief causes of infant deaths and the mortality compared with that in previous years from the same causes are given in Table VIII.

**Table VIII.**

Infant deaths per thousand births.										
	1913.	1914.	1915.	1916.	1917.	1918.	1919.	1920.	1921.	1922.
Tetanus .. ...	60	49	56	40	40	30	39	34	22	2
Intestinal diseases ...	64	62	60	63	68	61	71	54	38	36
Respiratory diseases ...	58	44	36	51	53	54	46	41	31	24
Prematurity and Debility.	63	66	46	50	57	46	48	47	32	15
Convulsions ...	5	7	11	12	13	12	9	9	24	59

These causes accounted for 518 of the 622 infant deaths which occurred.

Only 11 infants were certified as having died from tetanus; I wish I could believe that this figure is correct: 221 were returned as having died from convulsions: the corresponding figures for 1921 are 83 and 92.

During the last two years the doctor officiating as Deputy Registrar of Deaths has been changed three times and it is not surprising that the numbers certified to have died from certain diseases vary so much.

Table VIII is unreliable, the only returns that may be used with any exactitude as comparative figures are those given in Table VII.

Table IX is given to show a comparison between births, infant mortality, and general death rate for the preceding ten years and for 1922.

**Table IX.**

Year.	Estimated Population.	Births.		Deaths under 1 year.		Deaths at all ages.	
		Total.	Rate per thousand population.	Total.	Rate per thousand births.	Total.	Rate per thousand population.
1912 ...	102,167	2,481	23.69	633	261	3,605	35.28
1913 ...	102,913	2,464	23.95	703	284	3,595	34.93
1914 ...	103,664	2,545	24.55	664	260	3,577	24.50
1915 ...	104,420	2,808	26.89	671	239	3,206	30.70
1916 ...	105,183	2,708	25.75	692	255	3,162	30.00
1917 ...	105,950	3,099	29.25	831	269	3,831	26.16
1918 ...	106,723	2,940	27.55	673	229	4,430	41.50
1919 ...	107,502	3,203	28.86	782	244	4,024	27.43
1920 ...	108,286	3,321	30.67	681	205	3,554	32.82
1921 ...	123,300	3,768	30.56	631	167	3,313	26.87
Average for the preceding ten years ...	107,010	2,934	27.41	696	237	3,630	33.92
1922 ...	125,834	3,738	29.71	622	166	3,230	25.67

## Cause of Death.

5. Table X, shows the age, sex, and cause of death certified ; 1323 of the certificates were from Hospitals or private practitioners, 94 from the Coroner, and 1813 from the Deputy Registrar of Deaths.

In other words less than half of the cases were under medical attention before death. As the number of post-mortem examinations made was so small as to be negligible, the diagnoses here tabulated must be accepted with reserve.

Table X.

Deaths from.	Sex.	Age.											Total.	Grand Total.	
		Under 1 year.	1 to 5 years.	5 to 15 years.	15 to 25 years.	25 to 35 years.	35 to 45 years.	45 to 55 years.	55 to 65 years.	65 to 75 years.	over 75 years.	Unknown.			
1. Specific febrile or Zymotic diseases.															
Enteric fever ...	{ M. F.	... ...	... ...	... 1	1 1	... ...	... 1	1 ...	... ...	1 ...	... ...	... ...	3 3 }	6	
Diarrhœa ...	{ M. F.	48 35	21 20	4 3	... 1	1 2	2 1	4 ...	2 ...	2 1	... ...	... ...	84 63 }	147	
Dysentery ...	{ M. F.	4 ...	3 6	3 3	7 4	20 1	17 1	12 3	12 4	6 2	... ...	... ...	84 24 }	108	
Remittent fever	{ M. F.	2 1	... ...	1 ...	1 ...	... ...	1 ...	1 1	... ...	... 1	... ...	... ...	6 3 }	9	
Intermittent fever ...	{ M. F.	... ...	... ...	... ...	... ...	... ...	... ...	... 1	... ...	... ...	... ...	... ...	... 1 }	1	
Unspecified fever	{ M. F.	33 20	52 51	25 29	31 23	38 17	56 24	34 15	29 21	6 ...	... ...	... ...	304 200 }	504	
Syphilis ...	{ M. F.	7 6	1 ...	... ...	3 ...	5 1	10 1	6 ...	3 ...	... ...	... ...	... ...	35 8 }	43	
Puerperal fever	{ M. F.	... ...	... ...	... ...	... 14	... 7	... 1	... ...	... ...	... ...	... ...	... ...	... 22 }	22	
Other septic diseases ...	{ M. F.	2 3	... 2	1 ...	2 2	5 7	9 ...	6 1	5 1	2 1	... ...	... ...	32 17 }	49	
Phthisis ...	{ M. F.	2 1	3 4	1 4	26 21	78 37	79 33	67 22	46 12	11 6	... 1	1 ...	314 141 }	455	
Other Tubercular diseases ...	{ M. F.	... ...	... 1	3 3	2 2	5 2	3 ...	4 1	3 1	... ...	... ...	1 ...	21 10 }	31	
Leprosy ...	{ M. F.	... ...	... ...	... 1	... 2	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... 3 }	3	
Tetanus ...	{ M. F.	6 5	... ...	1 ...	2 ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	9 5 }	14	
Influenza ...	{ M. F.	3 1	1 2	1 4	2 ...	2 1	2 1	... ...	2 ...	... 2	... ...	... ...	13 11 }	24	
Diphtheria ...	{ M. F.	... ...	1 1	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	1 1 }	2	
Cerebro spinal Meningitis ...	{ M. F.	... ...	... ...	... ...	... ...	3 ...	2 ...	2 ...	... ...	... ...	... ...	... ...	7 ... }	7	
Whooping cough	{ M. F.	... 3	1 1	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	1 4 }	5	
Measles ...	{ M. F.	1 ...	2 1	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	3 1 }	4	
Total to carry forward ...	{ M. F.	108 75	85 89	40 48	77 70	157 75	181 63	137 44	102 39	28 13	... 1	2 ...	917 517 }	1434	



Deaths from.	Sex.	Ages.											Total.	Grand Total.
		Under 1 year.	1 to 5 years.	5 to 15 years.	15 to 25 years.	25 to 35 years.	35 to 45 years.	45 to 55 years.	55 to 65 years.	65 to 75 years.	over 75 years	Unknown.		
Brought forward ...	{ M. F.	108 75	85 89	40 48	77 70	157 75	181 63	137 44	102 39	28 13	... 1	2 ...	917 517 }	1434
<b>II. Parasitic diseases.</b>														
Malaria ...	{ M. F.	...2	3 4	5 4	20 4	25 6	21 5	16 2	10 1	3 1	... ...	2 ...	105 29 }	134
Malarial Cachexia ...	{ M. F.	... ...	... ...	... ...	... ...	... ...	2 ...	... ...	... ...	... ...	... ...	... ...	2 ... }	2
Worms ...	{ M. F.	... ...	5 9	4 4	3 1	4 3	10 ...	1 ...	2 ...	... ...	1 ...	... ...	30 17 }	47
<b>III. Dietetic diseases</b> ...														
	{ M. F.	... ...	... ...	1 ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	1 ... }	1
<b>IV. Constitutional diseases.</b>														
Rheumatism ...	{ M. F.	... ...	... ...	... ...	... ...	... ...	3 ...	2 ...	... ...	... 1	... ...	... ...	5 1 }	6
Cancer ...	{ M. F.	... ...	... ...	... ...	... ...	1 1	1 3	7 9	3 2	3 1	... 1	... ...	15 17 }	32
Anæmia ...	{ M. F.	... ...	... ...	... ...	2 ...	... ...	... 1	... ...	1 2	... ...	... ...	... ...	3 3 }	6
Beri-beri ...	{ M. F.	... ...	... ...	... 1	6 1	6 5	12 7	15 5	8 1	2 2	... ...	... ...	49 22 }	71
Rickets ...	{ M. F.	... ...	... ...	1 1	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	1 1 }	2
<b>V. Developmental diseases.</b>														
Premature birth	{ M. F.	21 8	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	21 8 }	29
Old age ...	{ M. F.	... ...	... ...	... ...	... ...	... ...	1 ...	1 2	11 13	37 43	30 65	... ...	80 123 }	203
<b>VI. Local diseases.</b>														
Convulsions ...	{ M. F.	125 96	7 13	1 1	1 ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	134 110 }	244
Other diseases of Nervous system	{ M. F.	2 ...	5 1	1 ...	... 3	... 1	... 1	3 2	2 ...	... ...	... 1	... ...	13 9 }	22
Organs of special sense ...	{ M. F.	1 ...	1 ...	... 1	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	2 1 }	3
Circulatory system ...	{ M. F.	1 6	1 2	6 1	7 3	19 6	16 12	24 8	13 7	9 15	2 4	6 ...	104 64 }	168
Totals to carry forward ...	{ M. F.	258 187	107 118	59 61	116 82	212 97	247 92	206 72	152 65	82 76	33 72	10 ...	1482 922 }	2404



Deaths from.	Sex.	Ages.											Total.	Grand Total.
		Under 1 year.	1 to 5 years.	5 to 15 years.	15 to 25 years.	25 to 35 years.	35 to 45 years.	45 to 55 years.	55 to 65 years.	65 to 75 years.	over 75 years.	Unknown.		
Brought forward ..	{ M. F.	258 187	107 118	59 61	116 82	212 97	247 92	206 72	152 65	82 76	33 72	10 ...	1482 922	2404
Bronchitis ...	{ M. F.	30 13	9 9	3 ...	... ...	... 1	2 3	2 ...	9 2	4 1	... ...	... ...	59 29	88
Pneumonia ...	{ M. F.	12 14	21 18	7 8	17 4	26 7	42 5	33 7	26 3	5 3	... ...	8 ...	197 69	266
Other diseases of respiratory system	{ M. F.	13 9	15 16	5 3	3 ...	7 2	10 2	9 1	4 1	1 ...	... 1	2 2	69 37	106
Enteritis ...	{ M. F.	27 18	5 5	3 1	1 2	... 1	4 2	2 2	... ...	... ...	... ...	... ...	42 31	73
Diseases of liver.	{ M. F.	3 ...	... ...	... ...	1 1	5 1	5 ...	6 ...	6 ...	... 1	... ...	1 1	27 4	31
Other diseases of Digestive system.	{ M. F.	4 2	2 1	1 1	3 1	9 ...	6 1	2 4	4 1	... ...	... ...	... ...	31 11	42
Glandlike organs of uncertain use	{ M. F.	... ...	... 1	... ..	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... 1	1
Urinary system	{ M. F.	1 ...	2 2	1 1	2 3	7 5	12 5	8 7	3 4	3 3	1 1	... ...	40 31	71
Generative organs ...	{ M. F.	... ...	... ...	... ...	... 1	... ...	... 1	... 2	... ...	... ...	... ...	... ...	... 4	4
Child birth and abortion ...	F.	...	...	...	8	8	1	...	...	...	...	...	17	17
Bones and joints	{ M. F.	... ...	... ...	... ...	... ...	... ...	... ...	1 ...	... ...	1 ...	... ...	... ...	2 ...	2
<b>VII. Violence.</b>														
Accident and Negligence ...	{ M. F.	... ...	... 1	2 ...	1 2	3 ...	... ...	... ...	2 ...	2 ...	... ...	3 1	13 4	17
Homicide, suicide and execution	{ M. F.	... ...	... ...	... ...	2 ...	6 ...	1 ...	1 1	2 ...	... ...	... ...	7 2	19 3	22
<b>VIII. Ill-defined causes.</b>														
Debility ...	{ M. F.	16 12	4 1	... 1	... ...	... ...	... 1	1 ...	2 ...	... ...	2 3	1 ...	26 18	44
Unknown ...	{ M. F.	1 2	... ...	... ...	1 ...	1 ...	... ...	... ...	... ...	1 ...	... ...	21 1	25 3	28
Starvation ...	{ M. F.	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	2 ...	2 ...	2
Diabetes ...	{ M. F.	... ...	... ...	... ...	... ...	1 ...	... ...	1 ...	5 2	... 1	... ...	... ...	7 3	10
Sunstroke ...	{ M. F.	... ...	... 1	... ...	1 ...	... ...	... ...	... ...	... ...	... ...	... ...	... ...	1 1	2
Totals ...	{ M. F.	365 257	165 173	81 76	148 104	277 122	329 113	272 96	215 78	99 85	36 77	55 7	2042 1188	3230

A comparison between the numbers of deaths attributed to some of the principal causes in 1922 and in the preceding ten years is shown here.

Table XI.

—	1912.	1913.	1914.	1915.	1916.	1917.	1918.	1919.	1920.	1921.	Average for pre- ceding ten years.	1922.
Phthisis ...	612	534	616	554	527	590	722	693	677	580	611	455
Malaria ...	787	500	469	421	473	455	478	606	505	420	511	134
Enteritis ...	167	220	213	202	213	266	257	318	265	186	230	73
Pneumonia ...	118	212	205	163	203	220	559	243	235	220	238	266
Bronchitis ...	124	140	103	80	98	148	198	152	146	126	132	88
Beri-beri ...	285	253	256	195	182	323	262	238	143	102	224	71
Debility ...	80	124	115	81	104	147	95	153	143	103	115	44
Dysentery ...	193	137	128	163	134	147	130	188	138	115	147	108
Tetanus ...	162	158	136	167	118	133	199	133	120	91	142	14
Old age ...	157	183	175	145	143	198	141	174	142	173	163	203
Unspecified fever ...	25	214	297	258	184	239	323	68	20	116	174	504
Small-pox ...	1	1	nil	8	41	7	16	142	18	2	...	nil.



The distribution of the chief causes of death among the various nationalities is shown in Table XII.

Table XII.

Certified cause of death.			European.	Eurasian.	Chinese.	Malay.	Indian.	Others	Unknown.	Total.
Enteric Fever	...	...	...	...	5	...	...	1	...	6
Diarrhoea	...	...	1	1	124	5	15	1	...	147
Dysentery	...	...	...	1	72	2	31	2	...	108
Remittent Fever	...	...	...	...	9	...	...	...	...	9
Unspecified Fever	...	...	...	...	245	149	107	3	...	504
Syphilis	...	...	...	...	36	2	5	...	...	43
Puerperal Fever	...	...	...	...	13	5	4	...	...	22
Other Septic diseases	...	...	...	1	35	3	7	3	...	49
Phthisis	...	...	...	9	346	36	59	5	...	455
Other Tubercular diseases	...	...	...	...	22	5	3	1	...	31
Leprosy	...	...	...	...	3	...	...	...	...	3
Tetanus	...	...	...	...	11	...	3	...	...	14
Influenza	...	...	...	...	19	3	1	1	...	24
Diphtheria	...	...	...	...	2	...	...	...	...	2
Cerebro Spinal Meningitis	...	...	...	...	6	...	1	...	...	7
Whooping Cough	...	...	...	...	4	...	1	...	...	5
Measles	...	...	...	...	4	...	...	...	...	4
Malaria	...	...	1	1	99	7	25	1	...	134
Worms	...	...	...	...	19	14	13	1	...	47
Cancer	...	...	1	...	25	1	4	1	...	32
Anaemia	...	...	...	...	3	1	2	...	...	6
Beri Beri	...	...	...	...	56	9	6	...	...	71
Premature birth	...	...	...	2	22	2	3	...	...	29
Old age	...	...	1	1	91	64	38	8	...	203
Convulsions	...	...	...	...	146	67	28	3	...	244
Other Nervous diseases	...	...	...	...	18	2	2	...	...	22
Diseases of Circulatory System	...	...	3	3	119	17	24	2	...	168
Bronchitis	...	...	...	3	62	9	14	...	...	88
Pneumonia	...	...	...	5	185	14	58	4	...	266
Other Respiratory Diseases	...	...	...	2	79	6	17	2	...	106
Enteritis	...	...	1	2	45	8	16	1	...	73
Diseases of Liver	...	...	...	1	26	...	3	1	...	31
Diseases of Digestive System	...	...	...	1	31	3	7	...	...	42
Diseases of Urinary System	...	...	1	...	45	12	12	1	...	71
Child-birth and Abortion	...	...	...	...	10	6	1	...	...	17
Accident and Negligence	...	...	...	...	12	2	3	...	...	17
Homicide, Suicide and Execution	...	...	1	1	14	...	6	...	...	22
Debility	...	...	1	...	24	6	12	1	...	44
Diabetes	...	...	...	...	6	1	1	2	...	10
Unknown and other causes	...	...	1	...	37	3	12	...	1	54
Total			12	34	2,130	464	544	45	1	3,230

Seasonal Mortality.

6. The deaths and death rate for each month are here recorded.

Table XIII.

Month.		Deaths.	Death rate per thousand.	Month.		Deaths.	Death rate per thousand.
January	...	264	24.68	July	...	254	23.74
February	...	217	22.45	August	...	275	25.71
March	...	256	23.93	September	...	279	27.76
April	...	280	27.04	October	...	258	24.48
May	...	293	27.39	November	...	280	27.86
June	...	290	28.01	December	...	284	27.34



## Infectious Diseases.

7. Table XIV shows the incidence among the different nationalities of the principal infectious diseases which occurred during the year.

Table XIV.

1922 Infectious Diseases.		Small-pox.	Chicken-pox.	Cerebro-Spinal Meningitis.	Enteric Fever.	Tuberculosis.	Influenza.	Puerperal Fever.	Diphtheria	Measles.	Whooping Cough.	Total.
European ...	M.	...	...	...	1	...	...	...	...	...	...	1
	F.	...	1	...	...	...	...	...	...	...	...	1
Eurasian ...	M.	...	3	...	...	4	1	...	...	...	...	7
	F.	...	2	...	...	5	...	...	...	...	...	8
Chinese ...	M.	2	2	8	5	274	14	...	2	3	1	311
	F.	...	1	...	2	94	12	13	2	1	3	128
Malay ...	M.	...	...	2	...	21	3	...	...	...	...	26
	F.	...	...	...	...	20	4	5	...	...	...	29
Indian ...	M.	1	24	4	2	35	1	...	...	7	...	74
	F.	...	3	...	1	27	1	4	...	2	1	39
Other Nations...	M.	...	4	...	...	1	1	...	...	...	...	6
	F.	...	1	...	1	5	...	...	...	...	...	7
Total ...	M.	3	33	14	8	335	19	...	2	10	1	425
	F.	...	8	...	4	151	18	22	2	3	4	212
Grand Total ...		3	41	14	12	486	37	22	4	13	5	637

### Small-pox.

8. Only three cases occurred. This low incidence, which is very gratifying, considering that the disease was rampant in Singapore and fairly prevalent on the mainland, we must attribute to the comparatively satisfactory vaccination state of our people and to the excellent work done by the Port Health Officer and other Government Medical Officers under the Quarantine and Prevention of Disease Ordinance; no actual case of Small-pox was permitted to land at Penang.

The three cases were sent to the Quarantine Camp in Perak Road.

The first case was reported from the District Hospital on 30th of January: he was a Hylam male aged 22 who had arrived from Singapore on 23rd January: he had marks of successful vaccination and had an attack of discrete small-pox: he was discharged cured on 2nd March.

The second case was a Macau male aged 28 who had been many years in Penang: he was unvaccinated: this case was seen on 8th of May and discharged cured on 27th of June: he had confluent small-pox but not of severe type: a lodger in the house travelled for his firm as far as Singapore and it is probable that he was the carrier of the infection to this house.



The last case was an Indian male aged 32 who had been in Penang only one month: he was unvaccinated: his business partner-vaccinated-had recently returned from an infected area in India and was probably the source of infection. This case was reported on 14th August and developed into discrete small-pox of severe type: he was discharged cured on 18th of September.

There was no second case from any of the three houses and we could trace no connection between any of the cases.

## **Vaccination.**

9. As mentioned in last year's Report we had some reason to fear invasion by Small-pox from infected districts with which we are in close communication. We therefore arranged to do some re-vaccinations. During the year 10,420 vaccinations and re-vaccinations were recorded, 9,183 by our staff, and 1,237 by others.

We completed in January the re-vaccination of the Police in the town, which had commenced at end of 1921, doing altogether 623.

At the end of January, we re-vaccinated 23 members of a Chinese club, contacts of a man who had Small-pox.

In March, thanks to the co-operation of the Inspector of Schools and the Heads of the Schools mentioned, we were able to re-vaccinate a total of 3,282 at the Free School, St. Xavier's Institution and the Anglo-Chinese School.

In May, we did 1895 Municipal employes, and in July, 87 scholars at the Convent.

In August, a Chetty developed Small-pox, and the rest of that community living in the same street, to the number of 294, came readily and cheerfully for re-vaccination,—an excellent example.

In August and September, we re-vaccinated 1098 scholars at the Vernacular Schools.

Out of the total of 6878 re-vaccinations performed during the year, we did in these batches 6779. I omit from this figure the 500 police who were done at the end of 1921.

The system of infant vaccination is the same as at the end of 1921, two senior Sub-Inspectors doing most of the work and securing satisfactory results. There were 3738 births during the year, our staff did 2305 successful vaccinations, and other vaccinators did 1237, total primary vaccinations, 3542; 622 infants died under the age of one year of whom 545 were unvaccinated.

It may be that our time is not yet come for another epidemic of Small-pox, but no one who realizes in what close contact with infected areas we have been for the last two years will doubt that our freedom from an outbreak has been largely due to vaccination. This is most clearly shown by the fact that we have had no contact case from any of the seven cases imported in 1921 and 1922.

## **Enteric Fever.**

10. 12 cases were notified; 5 by one private practitioner, 1 each by two other practitioners, and 5 by the Medical Officers of General and District Hospitals.

Of the cases 6 died, 5 being reported by private practitioners and 1 by Medical Officer of General Hospital

## **Cerebro-Spinal Meningitis.**

11. 20 cases were notified.

Of these 14 were persons resident within Municipal limits; 2 of these died at the District Hospital; the other 12 were transferred from the Government Hospital to the Quarantine Camp. 6 were Chinese, 4 Indians, and 2 Malays: of these 5 died, 4 Chinese and 1 Indian; 6 recovered and one, an Indian, almost cured, was still in Camp on 31st December.

No common source of infection was discovered in these cases.

Six Indians, recently arrived in Penang, were notified by Government Medical Officers; one died at the Government Hospital; the other 5 were transferred to the Quarantine Camp where 3 died and 2 recovered.

3 of these 6 cases came from the Indian Immigration Depot at Sungei Pinang.



## Chicken-pox.

12. 41 cases occurred amongst the different nationalities ; the Indians headed the list with 27 cases : this is a disease to which Indians seem to be particularly susceptible.

Some of the cases were severe but there were no deaths.

## Influenza.

13. In the months of February and March one practitioner notified 13 cases : they all recovered. During the year 24 others were reported as having died of this disease. Deaths were reported in the following months, February 1, March 1, April 4, May 2, June 6, July 1, September 2, October 1, November 3, and December 3.

General Practitioners reported deaths as follows :—

Four 4 cases, one 2 cases, six 1 case each : no cases were reported by Government Medical Officers nor by the Deputy Registrar of Deaths.

## Diphtheria.

14. Only 4 cases were notified ; all were Chinese ; two aged 3 and 4 years were admitted to the Quarantine Camp where one died. A woman aged 29 was treated at General Hospital and recovered ; the other a child of 18 months died at home.

## Measles.

15. This is not recognised as an infectious disease under Ordinance No. 157 (Quarantine and Prevention of Disease).

Within Municipal limits 4 Chinese and 9 Indian cases were brought to our notice : the 9 Indians were admitted to the Quarantine Camp where all recovered : the four, Chinese, aged 3 years, 1 year, 17 months, and 12 months, died, at home ; three from broncho-pneumonia following measles, and one from measles.

## Whooping Cough.

16. This is not notifiable as an infectious disease.

5 cases were reported after death at their homes : 4 were Chinese and 1 Eurasian : the cause of death was certified as broncho-pneumonia following whooping cough in three cases, and whooping cough in the remaining two.

## Tuberculosis.

17. In 1921 the deaths from Phthisis numbered 580, being 35 less than the average for the preceding ten years.

In 1922 the number falls to 455, and there are a further 31 certified as "other tubercular diseases", a total of 486 due to tuberculosis, or 3.86 per thousand of the population, corresponding to 652 or 5.28 per thousand in 1921.

Such figures are helpful if they spur us on to greater efforts but may be misleading if we take them as evidence of achievement.

It has often been pointed out that it is dangerous to attempt to be too precise in dealing with the death returns. For example the Deputy Registrar of Deaths may have to certify the cause of death with no reliable medical history available, or with information misleading or, at any rate, not sufficiently precise for him to form a definite diagnosis. He often finds it difficult to decide whether to diagnose malaria or phthisis and may honestly have to give up the attempt to be definite and return the vague but true diagnosis "unspecified fever". Post mortem examination or even the taking of a blood film is objected to by most people.



The Deputy Registrar of Deaths does his best.

We should therefore take this group of three together for comparison. We find in 1921, unspecified fever 116, phthisis 580, malaria 420, total 1116; and in 1922, unspecified fever 504, phthisis 455, malaria 134, total 1093. The total difference in the group is almost negligible, and we may assume that no such sudden fall has occurred in the actual phthisis death rate as would be seen from the figures and that a large number of the class shown as unspecified fever were really cases of phthisis or chronic malaria, the rest being chiefly hookworm disease, pneumonia, enteric fever, and various diseases of children, 156 out of the 504 being in children under 5 years old.

Had there been any great decrease in our phthisis rate, it would have been difficult to explain, for in spite of all that has been done there are still far too many dirty, ill-ventilated, and overcrowded houses in the town, and many of our phthisical citizens in the overcrowded areas are far too promiscuous and liberal with their sputum.

We continued our endeavours to secure improvements in many of the most defective dwelling houses, by the removal of obstructive partitions and various structural alterations to provide better light and ventilation.

As a routine practice, we had all houses disinfected in which a death from phthisis was reported.

The overcrowding of Lodging Houses is recognized as favouring the spread of phthisis, and we are trying to reduce this danger.

Our anti-spitting notices are still in use, and must have some effect in reminding those who have already received some instruction of the dangers of spitting.

Special lectures on this subject have been given to our staff, and they can give good advice in any house where suspected cases are found.

### **Puerperal Fever.**

18. 22 fatal cases were reported compared to 20 in 1921; only 4 of the cases were attended by qualified midwives; the others were without nurses or had called in local "bidans"—usually oldish women, unqualified, superstitious and often with but the haziest notion of surgical or other cleanliness.

The introduction of Ordinance No. 150 (Midwives) early in 1923 will decrease the number of "bidans" who will be permitted to "practice", the number of locally qualified midwives is increasing; the appointment of a second district nurse has been sanctioned: all these are factors which will tend to reduce the number of these regrettable and often fatal cases.

As shewn in Table XIV 13 of the cases were Chinese, 5 Malay and 4 Indian.

### **Dengue.**

19. In May, June and July there was a considerable number of cases; many of them were of a severe type but no deaths were certified from this cause.

At the houses where we made investigation *Culex fatigans* was the mosquito found.

*Aedes calopus* is also a common Penang mosquito.

These two are known carriers of this fever which is often so severe and prostrating as to be mistaken for malaria or influenza.

The previous outbreak was in August and September 1919.



## Anti-Mosquito Work.

20. The work of our Anti-Mosquito gangs was somewhat hindered during the last few months of the year by the prolonged and late rainy season ; but in spite of this handicap the coolies as usual did much to keep down the mosquito pest.

The oiling gang visited regularly once a week their usual sectors of the town, including the ditches near Sepoy Lines and on the Race Course.

The amount of oil used was, kerosine 1,800 gallons, and crude oil 5,070 gallons, the total cost being \$2,485. In 1921 the corresponding expenditure was, kerosine 2,440 gallons, crude oil 5,460 gallons, total cost \$3,924.

I am glad to be able to report that much more anti-mosquito work of permanent value has been done by filling in swampy patches of ground, pits, hollows &c. The Government, the Municipality, and private land-owners have borne the cost of such work in various places. The area most affected lies between Dato Kramat Road and Sungei Pinang, a troublesome district which still needs much improvement.

Useful work, though of less permanent value, has also been done by the small gang of men employed in filling with sand and cement possible breeding-places in our roadside trees.

The main cooly gangs again did good work, cleaning reserved roads, clearing ditches, cutting undergrowth, and filling in or draining swampy patches.

The chokra gang work heartily and dealt with large numbers of coconut shells, tins, and other minor breeding-places.

Our coolies attended to 102 requests for anti-mosquito work to be done on private land at the owners' expense.

Our men were employed in this way 56 times in 1921, and six times in 1920, the increase being chiefly due to the orders which we issue under the Anti-Mosquito Ordinance.

We continued to search for Anopheline breeding-places and found, within Municipal limits *A. rossi* 22 times, *A. vagus* 7 times, *A. kochi* 12 times, and *A. karwari* once.

We did little investigation beyond our boundaries, but shortly before the Thaipusam festival it was thought prudent to search the area where such large numbers of our citizens and others stay during that period. Just outside our limits *A. fuliginosus* was found breeding freely near the quarry. Many breeding places were destroyed by draining pools, and clearing and deepening ditches ; at the same time our coolies spent some days in cutting down and burning the undergrowth in this area. Before the festival all the places which still seemed dangerous were oiled.

It is disappointing to have to record that most householders still show great ignorance and apathy by their failure to give the little support we ask for in our efforts to keep premises free from mosquitoes.

Every house and compound should be searched once a week for mosquito "nests;" a few minutes each week should be enough for this, for if the inspection is always done on the same day, the servants very soon learn to have the place clean for the occasion, and the master's time is not occupied in talking about tins and other rubbish.

Apart from its value in anti-mosquito work, such a weekly tour of inspection is strongly recommended as an elementary measure of preventive medicine, the neglect of which leads to much trouble.

Our inspectors lose much time in calling the attention of householders to obvious collections of rubbish in their compounds, and in addition found it necessary to issue 343 notices during the year asking for tins, &c., to be removed or undergrowth to be cut.



## Theatres.

**21.** The hope was expressed in last year's report that a great improvement would soon be seen in the sanitary condition of our theatres.

Early in 1922 the Health Officer and the Engineer visited all the theatres and made a list of the improvements which they thought necessary.

Most of these alterations have been completed, and the theatres are now in a much more wholesome condition.

The sanitary conveniences have been improved in nearly all the theatres, and actors' quarters have been provided or improved where required.

Special mention may be made of the Campbell Street Theatre which has been improved so as to be scarcely recognizable, the new concrete floor in the main hall being the most important change perhaps.

The new front of the Drury Lane Theatre is also excellent, but the floor is insanitary and should be done away with. Improvements of permanent value, such as the substitution of a concrete floor for a bad wooden one, are always worth doing and cannot fail in the long run to benefit the owners of the theatres as well as their audiences.

## Water Supply.

**22.** Penang is fortunate in the possession of a Municipal water supply so pure that it can safely be consumed in the same state as it is supplied from the tap, no filtration etc., being required.

The laboratory reports on the water supply remain good, and there was no shortage during the year, although the Municipal Water Engineer before his departure on leave showed some anxiety about the lack of rainfall on our catchment areas.

This anxiety led him to doubt the soundness of our policy of closing down all domestic wells where reasonably possible.

We continued, however, to pursue this policy, being convinced of its wisdom, since all the wells are "shallow wells," and most are unsteined and without even a parapet.

During 1922 we served 241 notices requiring the closure of wells, and 231 wells were closed.

There are still many wells in the outlying districts of the town supplying water to houses where there is some special difficulty in arranging a full Municipal water supply ; but even these houses usually get Municipal water for drinking purposes.

It is expected that when the proposed new water scheme is complete, we shall easily be able to have a supply of pure drinking water for every house within our limits.

## Medical Attendance.

**23.** Medical advice or treatment was given to Municipal employees 2,537 times.

The total for 1921 was 2,106 and for 1920 was 1,778.

The number seen per month varied from 347 in July to 124 in January.

The number seen in the different departments were :—Engineer 971, Health Officer 586, Electrical 434, Fire Brigade and Ricksha Office 205, Water 168, Secretariat 130 and Veterinary Surgeon 43.



## Registration of Births & Deaths.

**24.** This work is still beset with difficulties. No reduction has yet been made in the time allowed for the registration of births, 14 days remains the limit,—a bad arrangement, not counter-balanced by any benefit to anyone in Penang.

In Great Britain and Ireland the Notification of Births Acts 1907 and 1915 provide that in the case of every child born, whether alive or dead, it shall be the duty of the father of the child, and of any person in attendance on the mother at the time of birth, to give notice in writing, within thirty-six hours of the birth, to the Medical Officer of Health ; there is penalty for non-compliance.

Of the infant deaths during the year, 35 per cent. occurred under the age of one month ; early notification of births might have led to the saving of some of these helpless innocents through the ministrations of our District Nurses.

The registration of deaths is a more difficult problem. It is comparatively easy to enumerate the deaths accurately and promptly, twelve hours is the limit of time allowed for notification, but it would require a Deputy Registrar of Deaths with superhuman skill and intuition to arrive at anything like consistent accuracy of diagnosis of the cause of death. The Deputy Registrar of Deaths must form his opinion often on the most meagre information, and even where the history given by the relatives seems good, it may be misleading owing to their faulty powers of observation.

Our annual reports have for many years commented on the unsatisfactory lack of accuracy in our death returns, figures which should be of the greatest assistance to us in guiding our efforts in preventive medicine.

In 1922, almost seven-twelfths of the total deaths were certified by the Deputy Registrar of Deaths. 1813 out of 3230 not having been under treatment by a qualified practitioner nor certified by the Coroner.

To arrive at a comparison between the returns received from (a) Hospitals, (b) private doctors, (c) the Deputy Registrar of Deaths and (d) the Coroner, I have drawn up a table of some principal causes of death, showing their distribution among these four authorities.

Cause of death.					Number certified by			
					Hospitals.	Private Doctors.	Deputy Registrar of Deaths.	Coroner.
Enteric fever ...	...	...	...	...	1	5	...	...
Diarrhoea ...	...	...	...	...	4	36	98	...
Dysentery ...	...	...	...	...	49	16	42	1
Enteritis ...	...	...	...	...	4	33	39	...
Unspecified fever ...	...	...	...	...	2	18	484	...
Malaria ...	...	...	...	...	55	65	14	...
Phthisis ...	...	...	...	...	104	102	246	3
Bronchitis ...	...	...	...	...	2	29	57	...
Pneumonia ...	...	...	...	...	63	43	151	9
Influenza ...	...	...	...	...	...	24	...	...
Remittent fever ...	...	...	...	...	...	9	...	...
Tetanus ...	...	...	...	...	2	6	6	...
Convulsions ...	...	...	...	...	1	26	217	...
Diseases of the circulatory system ...	...	...	...	...	37	98	24	9
Old age ...	...	...	...	...	6	9	188	...
Beri-beri ...	...	...	...	...	...	7	64	...

The total returns made by the Hospitals were 521, by private doctors 802, by the Deputy Registrar of Deaths 1813, and by the Coroner 94 ; that is roughly in the proportion of Hospitals 2, private doctors 3, and Deputy Registrar of Deaths 7.

There are reasons why particular diseases should not be expected to occur in this proportion in our death returns, but the actual divergence is remarkably wide.

I do not know what nourishment an expert statistician might derive from this table, but it is very unsatisfying to the mere Health Officer who wants to know what diseases are most prevalent.

## Municipal District Nurses.

**25.** The work was carried out on much the same lines as in 1921.

Miss A. Laurie continued to supervise the seven Chinese qualified midwives with much success.

Each midwife is engaged for a period of six months and is allotted a district in the town area proper : they did excellent work in attending babies who are not under the supervision of a qualified doctor.

Fourteen days is the time allowed by Ordinance No. 59 (Registration of Births and Deaths) in which a birth may be registered : an amendment to reduce the period to two days was strongly advocated by the Singapore and the Penang Municipal Commissioners in 1920 : the amendment was not adopted.



If we had earlier registration of births, our nurses would be able to see the babies and advise the mothers before much harm was done.

102 babies died less than seven days old and 73 between the age of seven and fourteen days.

### Milk.

**26.** Our custom of previous years was followed and only such samples were bought as shewed by lactometer that they were below the normal specific gravity.

20 such samples were purchased and analysed; in 6 the adulteration was so low that no further action was taken; summonses were issued against the other 14 and fines amounting to \$1,500 were inflicted.

The heaviest fine was \$300—this was for a third offence.

The greatest amount of adulteration with added water was 86%: this vendor was fined \$200.

The amount of added water in the other cases was:—53, 51, 32, 32, 21, 19, 15, 14, 9, 8, 8, 7, 7, % and six with not more than 3%

Section 20 (2) of Ordinance No. 139 (Sale of Food and Drugs) which says that a summons shall not be returnable in less than fourteen days from the date on which it is served has not yet been amended; as pointed out in the annual report for the previous year this gives a dishonest milk vendor ample time to settle his affairs and leave the district before proceedings can be taken against him.

The vendors of the milk containing 53% and 51% added water took advantage of this section of the Ordinance and have gone elsewhere.

A considerable amount of buffalo milk is imported from Province Wellesley and the main land. Such milk when pure is much richer than cow's milk and can be successfully watered down to the legal standard for cow's milk: the regulations under the Food and Drugs Ordinance lay down the standard for milk as "the normal, clean and fresh secretion obtained by completely emptying the udder of the healthy cow"; no special standard is laid down for, nor any mention of buffalo milk.

In my laboratory report for 1909 I wrote, "I am quite convinced that there should be distinct standards, higher than the English standard, for both cow and buffalo milks: that sellers should be licensed to sell either kind, or, if they wish to sell both kinds, to have a licence and badge for each: that each kind of milk should be sold separately: at present the licences are merely 'to sell milk'".

12 men were arrested for selling milk without a licence.

One afternoon each month, the Sanitary Inspectors were stationed at different parts of the town, and tested by lactometer the milk of all vendors who came along: these afternoon raids were started in 1920 in which year 76 samples of adulterated milk were discovered: for succeeding years the figures are 21 and 20.

Adulteration of milk is still too common, but I am glad to be able to report that the extra supervision which the vendors now receive seems to be having effect.

After medical examination 250 vendors were licensed: in 1921 the number was 234 and in 1920, 272.



## Quarantine Camp, Perak Road.

**27.** Urgent minor repairs were made to the Dresser's quarters and the European ward ; the camp became more and more delapidated and quite unfit for the reception of a large number of patients : drainage and the disposal of night soil are unsatisfactory.

During the year plans for the reconstruction of the camp were approved by the Government and the Municipality and work will probably start early in 1923.

It is fortunate that there was no epidemic : the cases of Chicken-pox, Measles and Cerebro-spinal Meningitis were distributed throughout the year and even our limited accommodation was sufficient.

During the rainy season several cases were admitted to the European or Eurasian wards, these being the only habitable wards in camp.

There were 106 admissions, including 32 healthy contacts.

Tables XV and XVI shew their distribution according to disease and nationality.

**Table XV.**

					Remaining on 1-1-22.	Admitted.	Total.	Discharged.	Died.	Remaining on 31-12-22.
Smallpox	...	...	...	...	...	3	3	3	...	...
Chickenpox	...	...	...	...	...	35	35	35	...	...
Cerebro-Spinal Meningitis	...	...	...	...	...	17	17	8	8	1
Measles	...	...	...	...	...	11	11	11	...	...
Diphtheria	...	...	...	..	...	2	2	1	1	...
Dengue	...	...	...	...	...	2	2	2	...	...
Syphilis	...	..	...	...	...	1	1	1	...	...
Acne	...	...	...	...	...	1	1	1	...	...
Scabies	...	...	...	...	...	1	1	1	...	...
Phthiasis	...	...	...	...	...	1	1	...	1	...
Total					...	74	74	63	10	1

Table XVI.

Nationality.					Remaining on 1-1-22.	Admitted.	Total.	Discharged.	Died.	Remaining on 31-12-22.
Eurasian	...	...	...	...	...	4	4	4	...	...
Chinese	...	...	...	...	...	19	19	13	6	...
Malay	...	...	...	...	...	7	7	7	...	...
Indian	...	...	...	...	...	70	70	65	4	1
Sinhalese	...	...	...	...	...	1	1	1	...	...
Japanese	...	...	...	...	...	1	1	1	...	...
Philipino	...	...	...	...	...	4	4	4	...	...
Total					...	106	106	95	10	1

Plans for the reconstruction of the Chinese Small-pox hospital at Batu Lanchang Road were approved and by the end of the year the work was well in hand.

In the event of a Small-pox epidemic this camp will be available for Chinese patients.

It will be maintained by the Chinese Community with no expense to the Government nor the Municipality : the Municipal Health Officer will supervise the camp and give instructions on its running.

My sincere hope is that the camp will never be occupied.

The treatment and isolation of Small-pox cases are necessary.

The Chinese Community are to be congratulated on the provision they have made for patients.

On the other hand Small-pox is a preventible disease and some of us consider that the money spent in erecting the Hospital would have been more usefully expended in a vigorous vaccination campaign amongst the Chinese over a term of years.

### Financial.

**28.** The total expenditure of the Health Department for 1922 was \$119,465.

This includes everything, the Quarantine Camp, the District Nurses' Scheme, Vaccination, Anti-Mosquito Work, all pay and allowances and the Commissioners' donations to the Provident Fund of our staff.

The total receipts amounted to \$17,388, leaving \$102,077 as the cost of the department to the ratepayers.

This represents a rate of 2.14%, or a little more than five pence in the pound sterling.



**Staff.**

**29.** H. L. McCulloch, S.I., and Lim Thean Soo, S.S.I., were confirmed in their appointments and placed on the permanent staff from 13th June.

F. A. Scully, S.S.I., who joined the service on 1st May was also confirmed in his appointment from 13th June.

W. P. P. Pereira and U. P. Balhetchet, S.S.Is., resigned on 1st January and 10th September respectively, owing to ill-health.

P. P. Aeria, S.S.I., died on 8th July.

Tan Cheng Hai, S.S.I., joined the service on 1st January and resigned on 1st May.

Lim Choon Hock and Yeap Hin Tat were appointed S.S.Is., on 1st August and 14th August respectively.

Dr. T. P. Khoo was appointed Deputy Registrar of Deaths from 1st September, vice Mr. E. Kandiah resigned.

The staff worked well through the year.

I have the honour to be,

Gentlemen,

Your obedient servant,

J. STUART ROSE, M.B., D.P.H.,

*Municipal Health Officer.*

PENANG, 31ST JANUARY, 1923.

To

THE MUNICIPAL HEALTH OFFICER,

PENANG.

Sir,

I have the honour to submit my report of the work done by the staff during the year ending 31st December 1922.

### General Sanitation.

The staff made 26,611 inspections and 26,163 re-inspections.

They found 1937 defective and 2828 filthy houses.

5847 notices were issued of which 5843 (including 37 unserved and brought forward from 1921) were served ; of these 6067 (including 617 outstanding on 31-12-21) have been complied with.

(Vide detailed list below).

Notices.			Outstanding on 31-12-21.	Unserved on 31-12-21.	Issued in 1922.	Served in 1922.	Unserved on 31-12-22.	Complied.	Work started.	Cancelled.	Carried forward 1923.
Nuisance	...	...	152	2	288	282	8	272	41	14	148
Lime washing	...	...	207	12	733	734	11	926	...	4	11
Latrines	...	...	9	3	243	245	1	240	3	2	12
Drains	...	...	16	1	63	62	2	66	5	1	11
Filthy premises	...	...	2	2	638	638	2	639	...	...	1
Com. Lod. Houses	...	...	89	2	716	717	1	767	...	16	23
Trades	...	...	1	...	478	478	...	476	1	...	3
Bakeries	...	...	...	...	861	861	...	853	...	2	6
By-laws	...	...	3	...	17	17	...	16	1	2	2
Partitions	...	...	86	3	641	641	3	668	4	7	52
Mosquitoes	...	...	30	4	343	340	7	330	...	4	36
Rats	...	...	5	2	28	29	1	27	...	3	4
Wells	...	...	17	3	242	241	4	231	13	2	25
Disinfection of infected houses.	...	...	...	3	541	543	1	542	...	1	...
Closing order	...	...	...	...	15	15	...	14	...	...	1
Total			617	37	5,847	5,843	41	6,067	68	58	335



58 notices were cancelled for various reasons.

272 Nuisance Notices were complied with during the year dealing with 600 houses, of which 225 houses were structurally altered to provide light and ventilation and land was set apart for back lanes or passages.

375 houses were repaired, i.e. floors, drains, roof and latrines put in order.

1 well was closed under a Nuisance Notice.

2 marshy lands were filled in and 95 other nuisances dealt with.

In 68 cases work has been started.

22 permits were granted to erect latrines or to construct drains.

### **Wells.**

241 notices under section 247 were served of which 231 were complied with ; 248 wells were closed : 4 Mandatory orders were obtained.

### **Cemeteries.**

The public cemeteries were visited 72 times and the private ones 98 times by our Inspectors during the year.

### **Exhumations.**

31 applications for exhumation of bodies were received but only 18 bodies were exhumed under special licence.

### **Passengers.**

339 passengers arrived from infected ports and passed through this office as against 141 last year.

### **Plans.**

294 plans were sent in and examined in this office as against 224 last year.

### **Prosecutions.**

391 summonses were issued during the year.

78 brought forward from 1921 (vide list A).

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Total ... 469

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385\* convictions were obtained, including 11\* milk-sellers arrested for selling milk without licences.

26 withdrawn.

8\* dismissed, including 1\* case arrested (unlicensed milk-seller).

62 carried forward to 1923.

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Total ... 481\* including the 12 cases arrested.

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63 Abatement of Nuisance, 8 Closing, 2 Prohibition and 13 Mandatory orders were obtained.

The fines imposed by the District Judge amounted to \$5,224-50 cents as against \$4,180-50 cents last year.

## Disinfections.

564 houses were disinfected during the year, as follows :—

Cerebro-spinal Meningitis	...	...	..	1
Plague	...	...	...	1
Small-pox	...	...	...	3
Chicken-pox	...	...	...	17
Phthisis	...	...	...	363
Diphtheria	...	...	...	4
Enteric and Enteritis	...	...	...	22
Leprosy	...	...	...	3
Measles	...	...	...	3
Puerperal fever	...	...	...	2
Diarrhoea	...	...	...	89
Beri-Beri	...	...	...	21
Dysentery	...	...	...	35
				—
			Total	... 564
				—

The houses disinfected being distributed as follows :—

**Cerebro Spinal Meningitis.**—Penang Road (1)

**Plague.**—Magazine Road (1)

**Small-pox.**—Muntri Street, Penang Street and Kelawei Road (1 each).

**Chicken-pox.**—Aier Etam Road, Northam Road and Patani Road (2 each) Western Road, Carnarvon Street, Muntri Street, Market Lane, Stang Tek Road, Pahang Road, Market Street, Chulia Street, Perak Road, Tek Soon Street and Gladstone Road (1 each).

**Phthisis.**—Chulia Street (28) Bridge Street (14) Jelutong Road Perak Road (13 each) Kuala Kangsar Road and Rope Walk (10 each) East Jelutong and Hutton Lane (9 each) McAlister Road and Noordin Street (8 each) Muntri Street and Beach Street (7 each) Penang Road, Dato Kramat Road, Magazine Road, Queen Street, Noordin Street and Armenian Street (6 each) Chulia Lane, Acheen Street, West Jelutong, Cintra Street, Campbell Street, Transfer Road and Toh Aka Lane (5 each) Love Lane, Kimberley Street, Argyle Road, Praugin Road, Carnarvon Lane, York Road, Brick Kiln Road, Aier Etam Road and Carnarvon Street (4 each) Jahudi Road, Malay Street, China Street, King Street, Maxwell Road, Cintra Street, North Beach, Kedah Road, Weld Quay, Singora Lane, Katz Street, Seck Chuan Lane, and Green Lane (3 each) Stewart Lane, Market Lane, Sungei Ujong Road, Cecil Street, Victoria Street, Western Road, Batu Lanchang, Pitt Street, McNair Street, Gladstone Road, Presgrave Street Ghaut, Kampong Java Lama, Tye Sin Street, New Lane, Beugal Lane, Burmah Road, Perlis Road, Sungei Pinang Road, Lorong Selamat, Kinta Lane, Anson Road, Bishop Street, Cannon Square and Burmah Lane (2 each) Barrack Road, Bagan Jeremal Road, Kampong Malabar, Batu Lanchang Road, Bertam Lane, Che Em Lane, Noordin Street Ghaut, McAlister Lane, Kampong Deli, Naning Street, Hongkong Street, Kanjang Road, Pahang Road, Ceylon Lane, Halfway Road, Abou Sittee Lane, Tamil Street, Kuantan Road, Siam Road, Stewart Lane, Merican Road, Malacca Court, Prangin Road Ghaut, Penang Street, Rice Course Road, Presgrave Street, and Larut Road (1 each).



**Diphtheria.**—Malacca Street, Seang Tek Road, Dato Kramat Road, and Madras Lane, (1 each).

**Enteric & Enteritis.**—West Jelutong (4) Noordin Street (3) Perak Road, East Jelutong, Bridge Street, (2 each) Church Street, Bengal Lane, Batu Lanchang, Beach Street, Carnarvon Lane, Brick Kiln Road, Chulia Street, Leith Street, Siam Road (1 each).

**Leprosy.**—Stewart Lane, Dato Kramat Road, and Caunter Hall (1 each).

**Measles.**—Patani Road (2) and Scotland Road (1).

**Puerperal fever.**—Transfer Road and McAlister Road (1 each).

**Diarrhœa.**—Bridge Street (8) Campbell Street (7) Argyle Road and Noordin Street (4 each), Noordin Street Ghaut, Rope Walk and West Jelutong (3 each) Magazine Road, Dato Kramat Road, Soo Hong Lane, Chulia Lane, Kimberley Street, Malacca Street, Penang Road, Seang Tek Road, Armenian Street, East Jelutong, Cintra Street, and Gladstone Road (2 each) Irving Road, Barrack Road, Bertam Lane, McAlister Road, Pitt Street, Love Lane, Muntri Street, Kuantan Road, Presgrave Street, Queen Street, Acheen Street, Tye Sin Street, McAlister Lane, Seang Tek Road, Sungei Ujong Road, Kulim Lane, Malay Street, Well Quay, Brick Kiln Road, Leith Street, Pahang Road, Muda Lane, Irving Road, New Lane, Perak Road, Prangin Road, Sungei Pinang Road and Beach Street (1 each).

**Beri.Beri.**—Rope Walk (5) Bridge Street, Chulia Lane, Penang Road, Dato Kramat Road, Muntri Street (2 each) Perlis Road, Caunter Hall, Queen Street, Campbell Street, Burmah Road, and Beach Street (1 each).

**Dysentery.**—Maxwell Road, West Jelutong and Presgrave Street, (3 each) East Jelutong, Batu Lanchang and Chulia Street (2 each) Prangin Lane, Jahudi Road, Madras Lane, Toh Aka Lane, Green Lane, Nyah Aboo Lane, Tye Sin Street, Tek Soon Street, Love Lane, The Fort, Leith Street, Aier Etam Road, Rangoon Road, Kuala Kangsar Road, Kedah Road, Transfer Road, Acheen Street, McAlister Road, Cintra Street, and Kimberley Street (1 each).

## Trades.

The fees collected during the year for trade licences amounted to \$7,977-50 against \$7671-60, an increase of \$305-90 (vide attached list B).

## Common Lodging Houses.

764 Common Lodging Houses were licensed during the year against 621 in 1921: the fees collected amounted to \$1,389-40 against \$1,146, an increase of 143 houses and increased fees amounting to \$243-20.

## Lodging Houses under the Minor Offences Ordinance.

20 Lodging houses were licensed under the Minor Offences Ordinance against 15 in 1921.

## Milk.

250 Milk sellers were registered in 1922 against 234 in 1921.

23 Summonses were issued during the year (14 for selling milk adulterated with added water and 9 for offences against the by-laws.  
40 Cases brought forward from 1921.

Total ... 63

23 convictions were obtained (including 11 men arrested for selling milk without a licence).

1 case was withdrawn.

3 dismissed, including 1 arrested case.

48 cases have been carried forward to 1923.

Total ... 75 including 12 cases arrested.

14 warrants were granted for the arrest of absentees; one was executed and the man fined on the original charge.

Fines amounting to \$1,500 were imposed, against \$1,332 in 1921, an increase of \$168.

## Vaccination.

Our Vaccinators made 2308 primary and 6978 secondary vaccinations ; these include the Masters and Pupils of the Penang Free School, St. Xavier's Institution, the Anglo Chinese School, The Convent, The Morning Star School, the Vernacular Schools and the Municipal Staff; 2570 tubes of lymph were used.

## Anti-Mosquito Works.

The Anti-Mosquito gangs did good work, cutting down vegetation, digging, levelling and clearing ditches, collecting old tins, coconut shells and burying them at Waterfall, York, Western, Perak, McAlister, Burmah, Jones, Sungei Pinaig, Jelutong, Brown, Gottlieb, Cantonment, Vermont, Barrack, Aier Etam, Anson, Trang, Dato Kramat, Seang Tek, Scotland, Batu Lanchang, Larut, Kelawei, Aier Rajah, Rangoon, Irving, Siam, Merican, Dunlop, Edgecumbe, Park, Scott, Krian, Tampin, Rembau, and Rahman Roads, and all private lands leading from them. College, Singora, Burmah, Duftree, Madras, Aboo Sittee, McAlister, New, Lee Andrew, Juru and Ipoh Lanes, Caunter Hall, East and West Jelutong ; they also cleared the river banks from the Chetty's Temple to Perak Road Bridge, and have started to clean up Sungei Mati : before and after the Thaipusam they cleared up the ground in the vicinity of the Temple.

The Chokra gang under Sub-Inspector Scully went through the Town Area destroying the minor breeding places of mosquitoes and clearing up generally.

All ditches, pools and swamps within the Town Area and the Race Course were regularly sprayed with kerosene and crude oil once a week ; 1800 gallons of kerosene and 5070 gallons of crude oil were used ; the cost was \$1,281-90 and \$1,203-54 respectively.

The gangs also cleared up private lands at the cost of the owners.

## Staff.

S. I., H. L. McCulloch was confirmed in his appointment on 13th June.  
 S. S. I., Lim Thean Sco do  
 S. S. I., F. A. Scully do  
 S. S. I. Lim Choon Hock joined the service on 1st August.  
 S. S. I., Yeap Hin Tat joined the service on 14th August.  
 S. S. I., Tan Cheng Hai who joined the service on 1st January resigned on 1st May.  
 S. S. I., W. P. P. Pereira resigned his appointment on 1st January owing to ill-health.  
 S. S. I., U. Balhetchet, owing to ill-health, resigned on 10th September.  
 S. S. I., P. P. Aeria—Vaccinator—died on 8th July and S. S. I., M. D'Souza was appointed as Vaccinator in his stead.

The staff as a whole worked satisfactorily.

I have the honour to be,

Sir,

Your obedient servant,

W. A. WARD,  
 Chief Sanitary Inspector.



## A

Prosecutions.		Brought forward from 1921.	Issued in 1922.	Cases in Court.	Convictions.	Withdrawn.	Dismissed.	A. N. C.	C. O.	P. O.	M. O.	Total.	Fines.		Costs.	
													\$	cts.	\$	cts.
Nuisance Notice	...	8	94	97	87	10	...	63	8	2	...	73	87	00	43	50
Nuisance Orders	...	2	16	12	11	1	...	...	...	...	...	...	122	00	5	50
Drains and Latrines	...	1	16	17	14	3	...	...	...	...	9	9	15	00	7	00
Trades	...	1	31	30	27	3	...	...	...	...	...	...	254	00	13	50
Com. Lod. Houses	...	...	53	53	51	1	1	...	...	...	...	...	652	00	25	50
Breach C.L.H By-laws	...	23	58	81	79	2	...	...	...	...	...	...	1,923	00	39	50
Filthy premises	...	...	12	12	11	1	...	...	...	...	...	...	51	00	5	50
Sec: 160/161	...	...	3	3	2	1	...	...	...	...	...	...	25	00	1	00
Bakery By-laws	...	1	33	34	30	2	2	...	...	...	...	...	252	50	15	00
Milk	...	40	23	* 27	† 23	1	‡ 3	...	...	...	...	...	1,500	00	48	50
Failing to report Birth	...	...	6	6	5	...	1	...	...	...	...	...	20	00	2	50
Breach of Pig By-laws	...	...	11	11	11	...	...	...	...	...	...	...	58	00	5	50
Breach of Cattle-shed By-laws	...	2	9	10	10	...	...	...	...	...	...	...	160	00	5	00
Lime Washing	...	...	4	4	3	1	...	...	...	...	...	...	10	00	1	50
Failing to report Small-pox.	...	...	1	1	...	...	1	...	...	...	...	...	...	...	...	...
Failing to report Death	...	...	1	1	1	...	...	...	...	...	...	...	...	...	...	50
Using N/S as manure	...	...	3	3	3	...	...	...	...	...	...	...	25	00	1	50
Mosquitoes	...	...	4	4	4	...	...	...	...	...	...	...	50	00	2	00
Closing Order Notice	...	...	3	3	3	...	...	...	...	...	...	...	25	00	1	50
Wells	...	...	8	8	8	...	...	...	...	...	4	4	5	00	4	00
Rats	...	...	2	2	2	...	...	...	...	...	...	...	...	...	1	00
Total	...	78	391	419	385	26	8	63	8	2	13	86	5,224	50	229	50

\* Including 12 police cases, arrested for selling milk without licences.

† „ 11 „ „ do. and convicted.

‡ „ 1 „ „ do. and dismissed.

Trade Licenses 1922.	No. 1921.	Fees.		No. 1922.	Fees.		No. Increase.	Fees.		No Decre- ase.	Fees.	
		\$	cts.		\$	cts.		\$	cts.		\$	cts.
Coal Depôt ... ..	1	12	00	1	12	00	...	...	...	...	...	...
Charcoal Depôt ... ..	42	252	00	32	192	00	...	...	...	10	60	00
Candle Factory ... ..	16	128	00	16	128	00	...	...	...	...	...	...
Cattle Shed and Cattle ... ..	52	353	00	56	366	00	4	13	00	...	...	...
Wood Depôt ... ..	79	474	00	75	450	00	...	...	...	4	24	00
Dyeing House ... ..	6	60	00	5	50	00	...	...	...	1	10	00
Fish Storing and Curing ... ..	46	552	00	37	444	00	...	...	...	9	108	00
Braziers, Foundries and Smi- thies ... ..	58	116	00	58	116	00	...	...	...	...	...	...
Pig Stys ... ..	50	100	00	55	110	00	5	10	00	...	...	...
Pig Stys (Free) ... ..	345	...	...	395	...	...	50	...	...	...	...	...
Pepper Washing Factory ... ..	2	20	00	2	20	00	...	...	...	...	...	...
Rags, Bones and Feathers ... ..	4	48	00	4	48	00	...	...	...	...	...	...
Soap Factory ... ..	16	128	00	14	112	00	...	...	...	2	16	00
Stables and Horses ... ..	30	166	00	44	170	00	14	4	00	...	...	...
Sheep and Goats ... ..	9	37	60	9	33	50	...	...	...	...	4	10
Tanneries ... ..	20	480	00	20	480	00	...	...	...	...	...	...
Blachan Factories ... ..	2	24	00	2	24	00	...	...	...	...	...	...
Bakeshops ... ..	39	195	00	36	180	00	...	...	...	3	15	00
Cookshops ... ..	188	940	00	201	1,005	00	13	65	00	...	...	...
Eatingshops ... ..	610	3,050	00	654	3,270	00	44	220	00	...	...	...
Storing and Curing Hides ... ..	7	84	00	5	60	00	...	...	...	2	24	00
Sago Factory ... ..	1	10	00	1	10	00	...	...	...	...	...	...
Attap, Kajang and Straw ... ..	43	129	00	33	99	00	...	...	...	10	30	00
Sugar Boiling ... ..	9	54	00	13	78	00	4	24	00	...	...	...
Market Gardens ... ..	65	...	...	42	...	...	...	...	...	23	...	...
Drying Cloth ... ..	2	10	00	2	10	00	...	...	...	...	...	...
Milk Sellers ... ..	234	234	00	250	250	00	16	16	00	...	...	...
Lodging Houses (Minor Offences Ordinance) ... ..	15	15	00	20	20	00	5	5	00	...	...	...
Fresh Meat and Fish ... ..	...	...	...	48	240	00	48	240	00	...	...	...
Total ... ..	1,991	7,671	60	2,130	7,977	50	203	597	00	64	291	10
Common Lodging Houses ... ..	621	1,146	00	764	1,389	40	143	243	40	...	...	...



